Engineering at NTU

NOTTINGHAM TRENT UNIVERSITY

Injecting new approaches into Engineering PGCE

Allen Bower shares some of the work from last year's engineering teacher trainees at Nottingham Trent University and a useful engineering context within initial teacher education - both at undergraduate and post graduate level.

It is now timely that emerging and existing teachers need to be prepared for the teaching of Engineering, particularly in the developing climate of Specialist Diplomas and other related Engineering initiatives/activities.

As a result of our endeavours to introduce PGCE Engineering we now have a strong annual uptake of potential Engineering teachers, from related graduate backgrounds. Their success is highlighted by the high profile posts they secure and the log of successful achievements in the taught components of their Subject Application Studies (an intense 12 weeks of design and make activity).

This article illustrates how trainees have responded to the challenge and the success of their individual projects. This type of assignment helps them prepare for teaching engineering and understand the potential of introducing engineering into the schools and colleges in which they will be employed. Their course consists of a generic programme of education professional studies, school/college based training (teaching practice), visits to vocational training and education centres, and SAS (subject application studies).

The need to 'design for a client' is indeed a feature of dual award engineering and at the time of introduction seemed most appropriate to the 14-19 agenda.

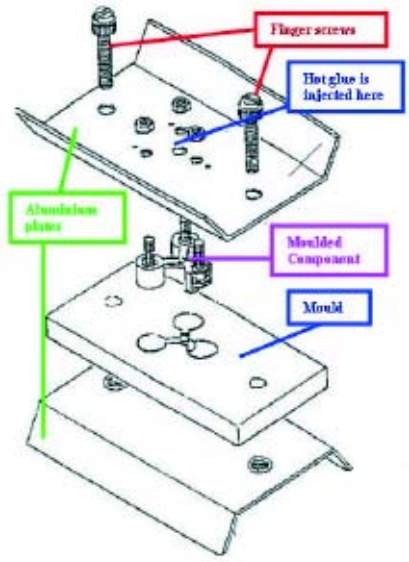
The challenge was to look at TEP's existing provision for injection moulding with a glue gun - Nick Baldwin visited the University and set the Engineering cohort the challenge/brief as the client:

"Investigate and develop equipment used to produce glue gun injection mouldings"

Almost all readers will be familiar with the existing bolt together laminate plate method from TEP. Trainees identified some areas for development that include:

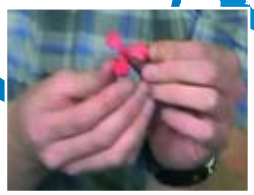
- **Difficulty of assembly and dismantling**
- **Slow repetitive use in workshop situation**
- **Holding glue gun**

We think you will agree that the range of ideas they responded with are creative and demonstrates a range of engineering processes and techniques.



Paul – *now teaching in Sheffield.*
Paul approached the problem with thoughtful observations about the assembly and disassembly of the current product and used strip magnets to act as the clamping device. This negated the need for the lengthy procedure of clamping the components together with long nylon screws.

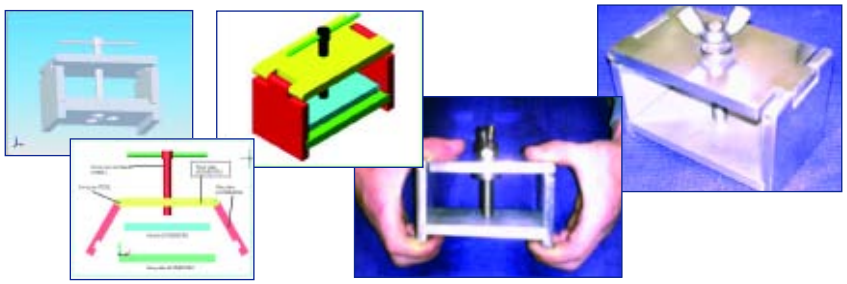




Laura – *is now teaching in Derbyshire at a well known and progressive engineering department.*
Laura approached the challenge with a slightly more traditional approach and admits she derived her theme from a stand and clamp arrangement used in science departments. You can see how easily the clamps can accommodate different moulds and heights


John – *now teaching in an inventive environment in a Nottinghamshire School.*
He decided to embark upon a small manufacturing centre approach and produced a quick release clamp principle (slots in the clamp plates allow the threaded fasteners to be swung away and released easily without fully unwinding the threads) with housing for ancillary equipment.

Stephen – *decided to tackle the problem head on with a more traditional solution reflecting his experience and knowledge of repairing automobiles.*
He exploited his knowledge of various CAD systems and utilised CAM techniques in the production of his solution. Again with a quick release method at its heart the single screw clamp reduces set up and release time and effort.



Glen – *now teaching Engineering at a Specialist Status school in Nottingham.*
He utilised much of his past engineering prowess and problem solving skills to present his solution. The result is extremely successful and easy to use. You can clearly see the quality and precision of all the assembled parts and the almost industrial features represented with bushes, sliding pins and plates.



The evaluation of our provision for Engineering was very complementary from an Ofsted survey, highlighting our commitment to first class initial teacher education.

Much of this success can only be celebrated because of TEP's enduring commitment to our endeavours in all aspects and programmes of trainee education.
Clearly Nottingham Trent have 'injected' some interesting ideas into their Engineering PGCE and of course the underlying learning and skills development far outweigh the product redesign task. This project formed the foundation of standards and aspirations in 2006.

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